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Pisione papuensis n.sp. (Polychaeta : Pisionidae), a new pisionid from Papua New Guinea [1]

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Abstract

A new species of the genus *Pisione*, described here as *Pisione papuensis* n.sp. was collected by the first author from Laing Island, Papua New Guinea, in september-november 1985. The species belongs to the *gopalai-complexa-alikunhii-africana* group of LAUBIER (1967).
Key words : Polychaeta, Pisionidae, taxonomy, Papua New Guinea.

Résumé

Une nouvelle espèce du genre *Pisione*, décrite ici comme *Pisione papuensis* n.sp. a été collectée de Laing Island, Papouasie Nouvelle Guinée par le premier auteur en septembre-novembre 1985. L'espèce se situe dans le *gopalai-complexa-alikunhii- africana* groupe de LAUBIER (1967).
Mots-clefs : Polychaeta, Pisionidae, taxonomie, Papouasie Nouvelle Guinée.

Introduction

To date, the genus *Pisione* GRUBE, 1856 comprises 20 species. Most are small interstitial organisms. Male copulatory organs can be either simple appendages or very elaborate modifications of the parapodia.
The genus is known from Central and South America, Europe, Africa, Asia and Australia, and occurs mostly in tropical or subtropical regions.
Pisione papuensis n.sp. extends the areal to Papua New Guinea.

Material and methods

The material was collected in 1985 on Laing Island, at the Belgian biological station King Leopold III. The animals were anesthetized with the $MgCl_2$ method. They were extracted from the sediment using a sieve with 0.125 mm mesh size and sorted under a dissecting microscope. They were subsequently fixed in formalin and later transferred to ethanol. Details of the anatomy of the animal (i.e. setae, copulatory organs, ...) were observed under dissecting microscope, light microscope and scanning electron microscope, the latter after critical point drying and coating with 300 Å of gold (paratype 1).

[1] Leopold III Biological Station, Laing Island. Contribution n° 264.

Taxonomic account

Pisione papuensis n.sp.
(Figs. 1-3)

LOCUS TYPICUS

Laing Island (Hansa Bay, Madang Province) 4°10'20" S ; 144°52'20" E, Papua New Guinea. Collected at Durangit Reef, in coarse sand, with ripple marks, at -6 m.
Material deposited in the collections of KBIN (Koninklijk Belgisch Instituut voor Natuurwetenschappen), Brussels.

HOLOTYPE

KBINPY2001. Male of 60 setigerous segments, 5.96 mm long and 0.22 mm wide at setiger 5, 0.23 mm at setiger 44, 0.46 mm parapodia included.
Copulation organ on setiger 37. Collected on 15-10-1985.

PARATYPES

Paratype 1 : KBINPY2002. Prepared for scanning electron microscopy. Station : locus typicus. Male with copulatory organ on setiger 41.
Paratype 2 : KBINPY2003 Male of 78 setigers with copulatory organ on setiger 39. Collected on Laing Island, littoral in coarse sand with coral rubble, on 25-9-1985.
Paratype 3 : KBINPY2004. Incomplete male of 41 setigers, with copulatory organ on setiger 30. Collected at

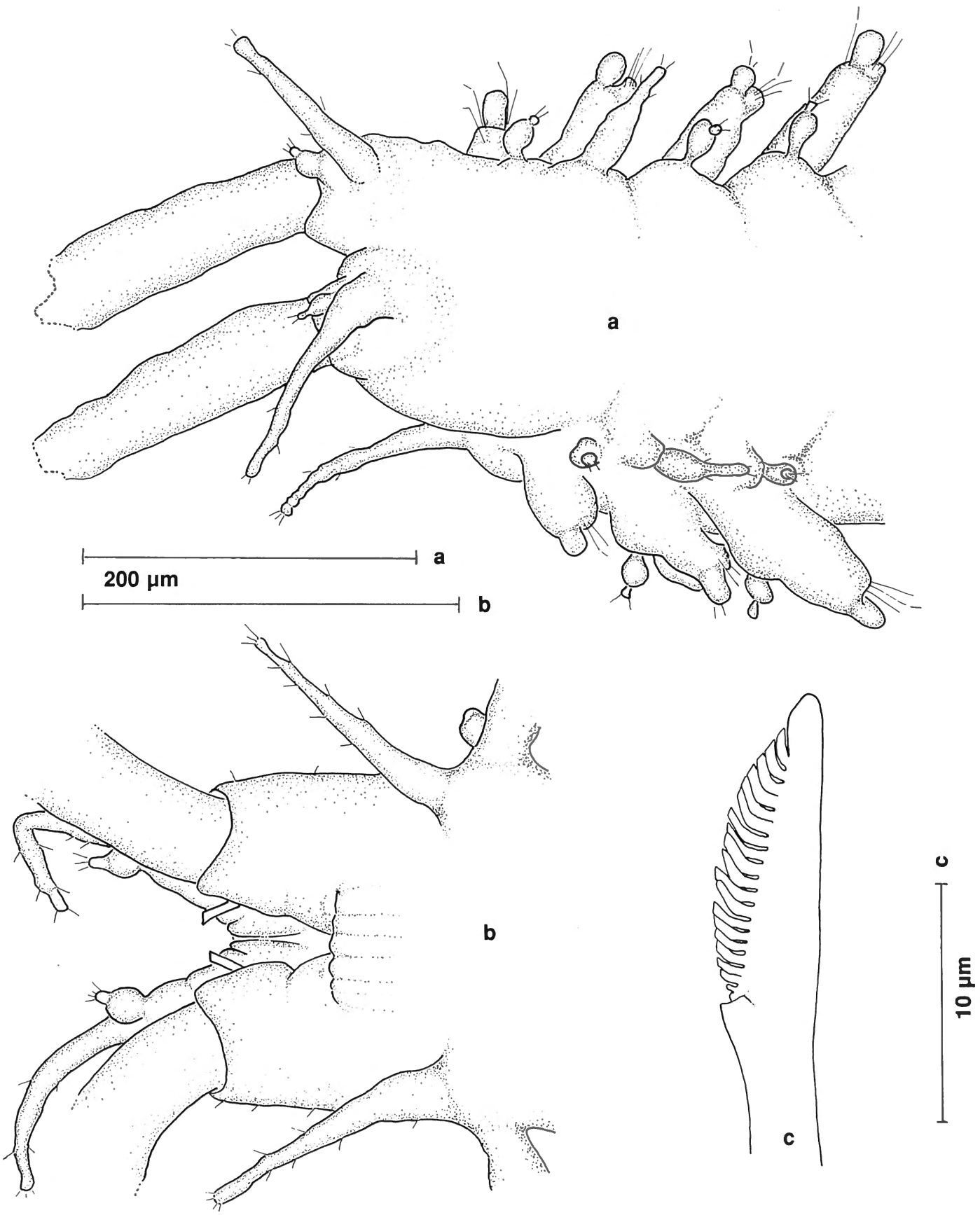

Fig. 1. – Pisione papuensis *n.sp.* :
a. Dorsal view of anterior segments (holotype).
b. Ventral view of anterior segments (paratype 2).
c. Simple seta from upper bundle, middle segment (after SEM photograph, paratype 1).

Durangit Reef NW, -6 m , in very coarse sand, on 9-10-1985.
Paratype 4 : KBINPY2005. Male of 62 setigers with copulatory organ on setiger 40. Collected at Durangit Reef NW, -6 m , in very coarse sand with ripple marks, on 14-10-1985.
Paratype 5 : KBINPY2006. Male of 60 setigers with copulatory organ on setiger 40. Collected at Durangit Reef N, -5 m, coarse sand, on 4-10-1985.
Additional material from Durangit Reef and the littoral of Laing Island deposited in KBIN under number IG 27.026

DESCRIPTION

Color of living animals : white.
Holotype : 60 setigerous segments, 5.96 mm long and 0.23 mm wide at setiger 44, without parapodia, and 0.46 mm parapodia included. Prostomium not conspicuous, buccal acicula stout, reaching back nearly to the 1st setigerous segment. Palps smooth and long (cf. paratypes, broken off in holotype).
Dorsal cirri of buccal segment nearly half as long as palps. Ventral cirri globular.
Ventral cirri of 1st setiger, elongated and tapering, reaching beyond the palpophores, about as long as dorsal cirri of buccal segment. Dorsal cirri of 2nd setiger slender and tapering, more than twice as long as on other segments (Fig.1a, 1b).
First parapodium smallest. Each parapodium with a round presetal lobe, covered with glands (Fig.2a, 3c, 3d). Dorsal and ventral cirri (except the elongated ones, dorsal on setiger 2 and ventral on setiger 1), globular with tufts of cilia on a terminal papilla. Two acicula, the dorsal smaller than the ventral one, the latter slightly curved at the tip (Fig.2d).
Setae : a superior bundle of 1 stout simple seta, with a notch at the base of the dentation (Fig.1c) and 1 slender composed seta with a long, subdistally twisted and rather pectinate blade and a shaft with an asymmetrical end and only half as thick as the shafts of the other setae (Fig.2c, 3e).
An inferior bundle of 3 falcigerous composed setae, with short stout dentated blades of different lengths and with undivided tip (Fig.2b, 3c).
Body smaller towards the pygidium with 2, 620 µm long smooth urites.
Copulatory organs : the parapodia on setiger 37 are strongly modified, forming the only pair of male copulatory organs (Fig.2d, 3a, 3b).
Dorsal cirrus unmodified. Parapodial lobe reduced, with only the upper bundle of setae present. Ventrally much enlarged to form a bifid (? modified ventral cirrus) and a stout, spirally wound structure. The spermaduct ends at the top of the latter. Tufts of sensory cilia on the ventral side visible on SEM.
The whole structure is orientated ventrally, making the presence of an abnormal segment very conspicuous from dorsal point of view.
Never more than one such segment present, the gonads extending in three previous segments.
The SEM-photographs show that the ventral and dorsal body wall is covered with cilia and circular pores of glands. The pores on the presetal lobe are of a very particular design (cart-wheel) (Fig.3c, 3d).

DISCUSSION

Pisione papuensis n.sp. belongs to the *gopalai-complexa-alikunhii-africana*-group of LAUBIER (1967) (in which we can also place *P. corallicola* HARTMANN-SCHROEDER, 1974; *P. papillata* YAMANISHA, 1976; *P.* sp. A WOLF, 1984 and *P. tortuosa* HARTMANN-SCHROEDER & PARKER, 1990) characterized by the presence in each segment of a composed seta with a long blade.
Pisione papuensis n.sp. resembles *P. papillata* YAMANISHA, 1976 as both species have only one pair of copulatory organs. *P. papuensis* differs in the presence of setae on the modified copulatory parapodium and in the shape of the presetal lobe, which is bifid in *P. papillata*.
Pisione africana DAY, 1963 also has an elongated dorsal cirrus on setiger 2 in adults, but differs from *P. papuensis* in having more than one set of copulatory organs and in the shape of the presetal lobe (bifid).
In *P. laubieri* HARTMANN-SCHROEDER, 1970 the dorsal cirrus on setiger 2 is not elongated and LAUBIER (1967) states that the tip of the upper composed seta in this species is bifid.
Pisione complexa ALIKUNHI, 1947 has a variable number (1 to 6) of copulatory organs and the dorsal cirrus on setiger 2 is not longer than those on other segments.
In *Pisione gopalai* ALIKUNHI, 1941, the ventral cirrus of setiger 1 is only slightly longer than those on the other segments while the dorsal cirrus on setiger 2 is not longer than those on the other segments. The single copulatory organ of *P. gopalai* is also totally different: "the entire parapodium excepting the dorsal cirrus gets suppressed..." (ALIKUNHI, 1941 p. 215) and its pygidium has very conspicuous groups of glands.
Pisione alikunhii TENERELLI, 1965 has pointed presetal lobes, with a minute fillet in anterior segments and the single copulatory organ is also quite different from *P. papuensis* n.sp., both in structure and in reduction of setae.
Pisione corallicola HARTMANN-SCHROEDER, 1974 differs in the length of the cirri of setiger 1 and 2 and in the form of the two presetal lobes. The copulatory organs are not described.
Pisione sp. A WOLF, 1984 has uniform small dorsal cirri and has two pairs of copulatory organs, that are different from those on *P. papuensis* n.sp.
Pisione papuensis n.sp. resembles most *P. tortuosa* HARTMANN-SCHROEDER & PARKER, 1990 but is smaller. *Pisione tortuosa* moreover has parapodia with two

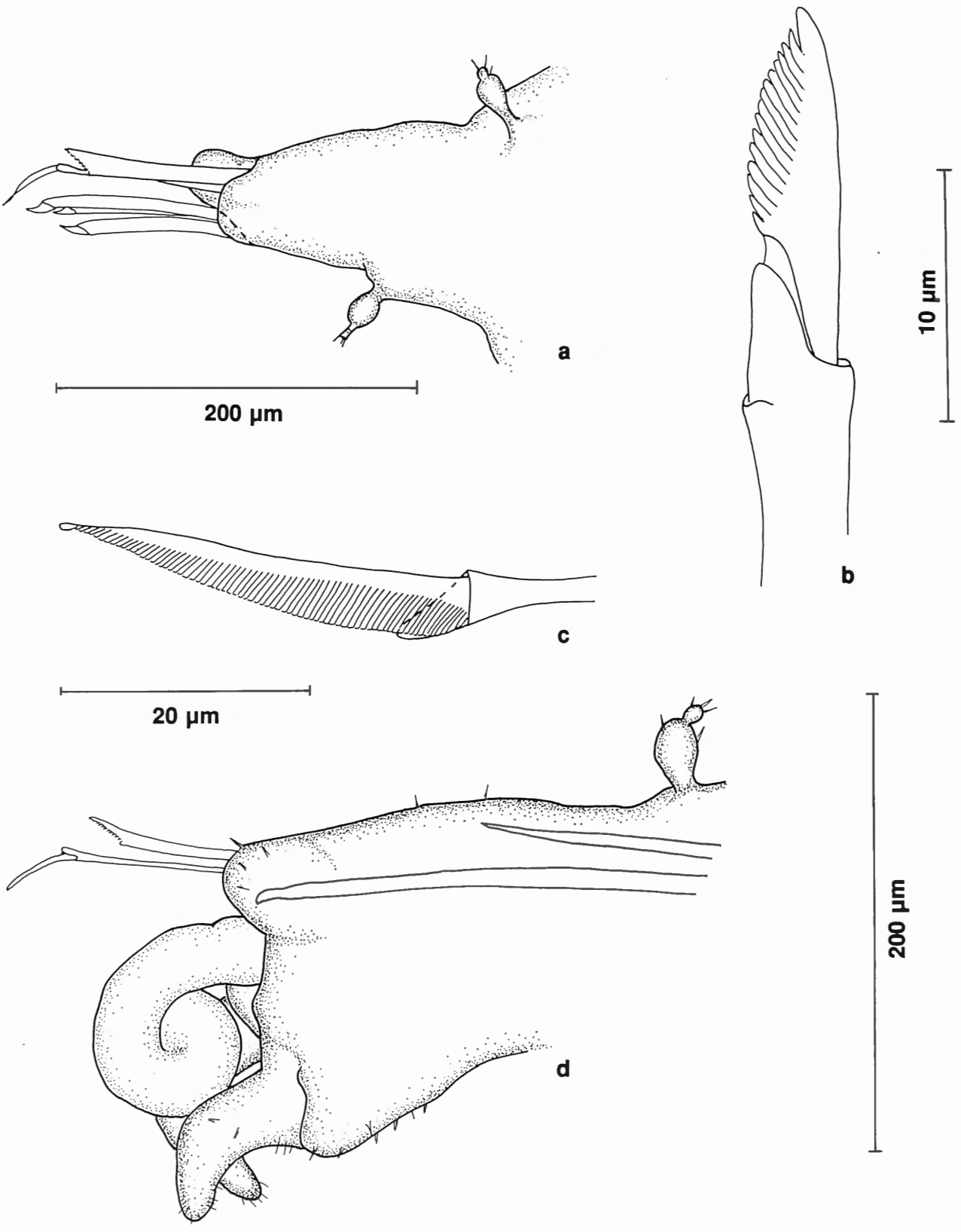

Fig. 2. – Pisione papuensis *n.sp.* :
a. Posterior view of parapodium of setiger segment 30 (paratype 5).
b. Falciger seta, setigerous segment 36 (after SEM : paratype 1).
c. Composed seta with long blade, setiger 37 (after SEM : paratype 1).
d. Anterior view of male copulatory organ on setiger 39 (paratype 2).

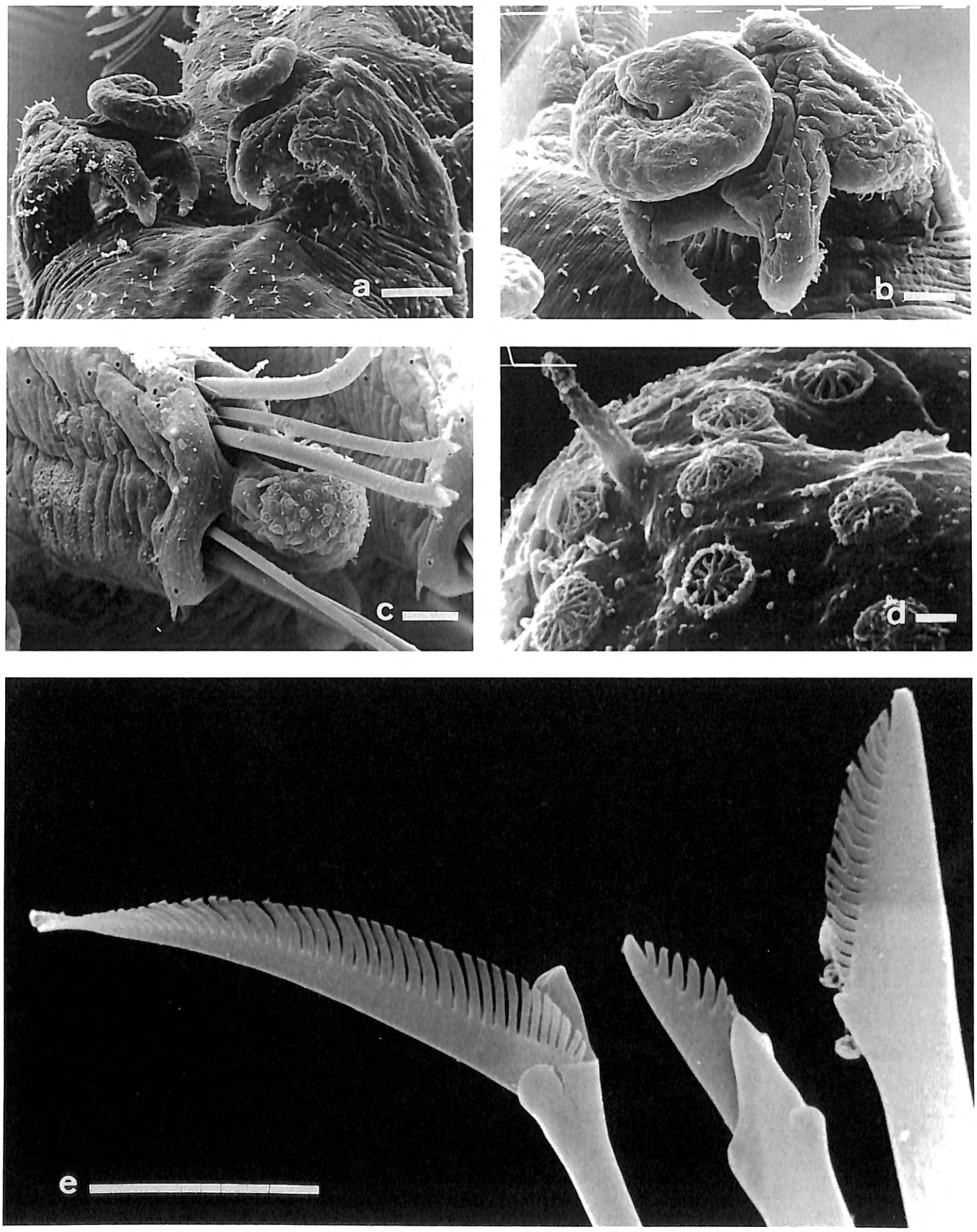

Fig. 3. – Pisione papuensis *n.sp.; SEM photographs (paratype 1) :*
a. Postero-ventral view of male copulatory organ (setiger 41, scale = 500 µm).
b. Detail of male copulatory organ, ventral view (setiger 41, scale = 200 µm).
c. Postero-ventral view of a middle parapodium (setiger 28, scale = 100 µm).
d. Detail of top of presetal lobe (setiger 25, scale = 1 µm).
e. Setae of a middle parapodium (setiger 18, scale = 10 µm).

presetal lobes, one rectangular and one conical. The setae are very similar to those of *P. papuensis* n.sp. but the falcigerous composed setae have a bifid tip. The copulatory organs are not mentioned.

ETYMOLOGY

As this is the first *Pisione* described from Papua New Guinea, we named it after this country.

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